

WHAT IS CLAIMED IS:

1. A cationic catalysis system comprising an initiator (I), a catalyst (K) and a cocatalyst (CoK), wherein the cocatalyst (CoK) is an agent which releases the polymerization active center from its counterion generated by the reaction between the catalyst (K) and the initiator (I).
2. (canceled)
3. The catalytic system as claimed in claim 1, wherein the cocatalyst (CoK) is a molecule having at least one double bond depleted in electrons by an electron-withdrawing group.
4. The catalytic system as claimed in claim 3, wherein the cocatalyst (CoK) is selected from the group of complexing agents consisting of o-chloranil (3,4,5,6-tetrachloro-1,2-benzoquinone), p-chloranil (2,3,5,6-tetrachloro-1,4-benzoquinone), nitrobenzene, trinitrobenzene, tetracyanoethylene, difluoronitrobenzene, pentafluorobenzene, hexafluorobenzene and octafluorotoluene.
5. The catalytic system as claimed in claim 1, wherein the catalyst (K) comprises an element (M) selected from the group consisting of Groups IB, IIB and A, IIIB and IIIA, IVB and IVA, VB and VA, and VIIIB of the Periodic Table of the Elements.
6. The catalytic system as claimed in claim 5, wherein the element (M) is selected from the group consisting of the chemical elements B, Ti, Sn, Al, Hf, Zn, Be, Sb, Ga, In, Zr, V, As and Bi.
7. The catalytic system as claimed in claim 5, wherein the catalyst (K) is a Lewis acid of general formula  $R_nMX_{3-n}$  for M an element belonging to Group IIIA, of general formula  $MX_4$  for M an element belonging to Groups VA, IVA and IVB, and of general formula  $MX_5$  for M an element belonging to Group VB, with:

- R a monovalent radical taken from the group consisting of trifluoromethylsulfonate, hydrocarbon groups with 1 to 12 carbon atoms of alkyl, aryl, arylalkyl, alkylaryl or cycloalkyl type, and alkoxys;
- 5        - X a halogen atom taken from the group F, Cl, Br and I;
- n an integer from 0 to 3.

8.        The catalytic system as claimed in claim 5, wherein the catalyst is selected from the group consisting of  $\text{TiCl}_4$ ,  $\text{ZrCl}_4$ ,  $\text{SnCl}_4$ ,  $\text{VCl}_4$ ,  $\text{SbF}_5$ ,  $\text{AlCl}_3$ ,  $\text{AlBr}_3$ ,  $\text{BF}_3$ ,  
10         $\text{BCl}_3$ ,  $\text{FeCl}_3$ ,  $\text{EtAlCl}_2$ ,  $\text{Et}_{1.5}\text{AlCl}_{1.5}$ ,  $\text{Et}_2\text{AlCl}$ ,  $\text{AlMe}_3$  and  $\text{AlEt}_3$ .

9.        The catalytic system as claimed in claim 5, wherein the initiator (I) can be a monofunctional molecule (I1), a difunctional molecule (I2), a molecule substituted by one or more halogen atoms (I3) or a Brønsted acid (I4).

15        10.        A process for the cationic polymerization of C3 to C10 monomers involving a catalytic system comprising an initiator (I), a catalyst (K) and a cocatalyst (CoK), wherein the cocatalyst (CoK) is an agent which releases the polymerization active center from its counterion generated by the reaction between  
20        the catalyst (K) and the initiator (I).

11. The process as claimed in claim 10, wherein the monomers are selected from the group consisting of dimethylketene, isobutylene, but-1-ene, 4-methylpent-1-ene, oct-1-ene, 2-methylbut-1-ene, 3-methylbut-1-ene, 2-methylbut-  
25        2-ene, styrene, styrenes substituted by alkyl radicals,  $\alpha$ -methylstyrene,  $o$ -p-methylstyrene, halosubstituted styrenes, p-chlorostyrene, propylene, isopentene, vinyl monomers, vinyl ethers, diolefins or cyclodiolefins with conjugated dienes, 1,3-butadiene, 2,3-dimethyl-1,3-butadiene, hexadiene, myrcene, 6,6-dimethylfulvene, piperylene, isoprene, cyclopentadiene, cyclohexadiene,  
30        vinylnorbornene, and  $\beta$ -pinene.

12.        A polymer polymerized by the process as claimed claim 10.

13. (canceled)